Dorsomorphin Promotes Human Embryonic Stem Cell Self-Renewal.

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Public Summary:
To screen for small-molecules that promote self-renewal, H9 hESCs were seeded into matrigel coated 384-well plates and screened against a diverse chemical library of 50,000 heterocyclic compounds. From the screen, dorsomorphin (DORSO), an inhibitor of bone morphogenic protein (BMP) type I receptors (ALK2, ALK3, and ALK6), maintained the highest percentage of OCT4 positive cells in a dose-dependent manner, with an EC50 of 1 μM. Further immunohistochemical and in vivo analysis indicated that greater than 90% of the cells maintain expression of the self-renewal associated proteins NANOG, SOX2, SSEA-4, and Tra-1-80 after five passages in UM medium plus DORSO and form teratomas after injection into SCID mice. Collectively, these results indicated that Dorsomorphin promotes hESC self-renewal and pluripotency.

Scientific Abstract: